files to drive the conductive layers to provide various tactile feedback to the user through the user input mechanism.

[0067] As an example, consider FIG. **5***a* which illustrates a side sectional view of an example material assembly in accordance with one or more embodiments generally at **500**. In this example, material assembly **500** includes a user input mechanism in the form of a knob **502**. The knob can comprise any suitable type of knob which is engageable by a user. Additionally, any suitable type of user input mechanism can be used. In at least some embodiments, the user input mechanisms can be either virtual or non-virtual. For example, a virtual user input mechanism can include, by way of example and not limitation, sliders, buttons, and the like. The knob **502** is connected via a shaft to a bearing **503**.

[0068] Material assembly **500** also includes an actuator mechanism **506** operably associated with the knob **502**. The actuator mechanism is configured to provide tactile feedback to a user responsive to a user touching or otherwise engaging the knob **502**. In at least some embodiments, the actuator mechanism **506** comprises a pair of spaced-apart substrates **508**, **510** each of which is conductive or supports a conductive layer of material. In at least some embodiments, a dielectric material **516** and an adjacent air gap are interposed between the substrates **508**, **510**. In addition, actuator mechanism **506** also includes a spring mechanism to **520**, **522**. Any suitable type of spring mechanism can be utilized such as various types of mechanical springs, rubberized springs, rubberized stoppers, elastomeric material, resilient gasket material, and the like. Examples of suitable types of springs and spring mechanisms are described in U.S. Provisional Application No. 61/143,203 incorporated by reference above.

[0069] Any suitable type of materials can be utilized to provide components of the material assembly **500**.

[0070] For example, in at least some embodiments, substrates **508**, **510** can be formed from a clear material such as plastic or glass. Additionally, the conductive layers of material can comprise any suitable type of conductive material. In at least some embodiments, the conductive material is a clear conductive material. Alternately or additionally, in at least some embodiments, the conductive material is a spray-on material or film that is coated onto the surfaces of substrates **508**, **510** as described above. Alternately or additionally, in at least some embodiments, the conductive material can comprise indium tin oxide, silver, copper, or any other suitable type of conductive material.

[0071] Dielectric material **516** can comprise any suitable type of dielectric material such as, by way of example and not limitation, air, glass, plastic, elastomeric material, gels and/or other fluidic or non-fluidic materials.

[0072] In one or more embodiments, various parameters associated with the material assembly **500** can be selected in order to provide desired operating characteristics. For example, parameters associated with the dimension of air gap, the thickness of dielectric material **516**, and the dielectric constant of dielectric material **516** can be selected in order to provide desired operating characteristics. Example parameters have been given above.

[0073] The material assembly **500** can have other components associated with it, such as those components illustrated and described in connection with FIG. **3**. As such, the drive circuitry that can be utilized in connection with material assembly **500** can provide tactile feedback to a user when the user, for example, turns the knob. For example, a particular signal or voltage profile can be selected and applied, as described above, to provide tactile feedback in the form of repeated clicks when the knob is turned by the user. It is to be appreciated and understood, however, that other profiles can be used depending on the type of user input mechanism.

[0074] As another example, consider FIG. **5***b* which illustrates a side sectional view of an example material assembly in accordance with one or more embodiments generally at **500***b*. In this example, material assembly **500***b* includes a user input mechanism in the form of a key **502***b* such as one would find on a computer keyboard.

[0075] Material assembly **500***b* includes an actuator mechanism **506***b* operably connected to key **502***b* and comprising a pair of spaced apart substrates **508***b*, **510***b* each of which has conductive properties. In the present example, substrate **508***b* can comprise any suitable type of substrate examples of which are provided above. In this particular example, substrate **510***b* comprises a metal backer material such as sheet metal. Of course, any suitable type of material can be utilized. Actuator mechanism **506***b* also includes spring mechanisms **520***b*, **522***b*, **524***b*, and **526***b*. Spring mechanisms **520***b* and **524***b* are connected between substrate **510***b* and key **502***b*. Spring mechanisms **522***b* and **526***b* are connected between substrate **510***b* and substrate **508***b*.

[0076] Further, actuator mechanism **506***b* includes a membrane switch layer **528***b* and a detent **530***b* connected to the underside of key **502***b*. When key **502** is depressed, detent **530***b* comes into contact with membrane switch layer **528***b* closing a switch. When the switch is closed, drive electronics can apply an electronic signal to substrate **508***b* and/or substrate **510***b* thus causing substrate **508***b* to be attracted to substrate **510***b*. This can provide haptic feedback to a user. In at least some embodiments, 40 to 50 g of pressure can be utilized as a key spring force to press down the key to the membrane switch layer. Further, the membrane switch layer can achieve switch closure with about 10 to 20 g of pressure.

[0077] Having considered various embodiments, consider now an example method that can be implemented by the embodiments described herein.

[0078] Example Method

[0079] FIG. **6** is a flow diagram that describes steps in a method in accordance with one or more embodiments. The method can be implemented in connection with any suitable hardware, software, firmware, or combination thereof. In at least some embodiments, the method can be implemented in connection with systems such as those that are described above.

[0080] Step **600** senses user input. This step can be performed in any suitable way. For example, in at least some embodiments, a user's input can be sensed responsive to the user touching a touch surface such as a touch screen or touch pad. In yet other embodiments, a user's input can be sensed relative to a user input mechanism. Examples of user input mechanisms have been provided above. In addition, examples of various technologies that can be utilized to sense a user's input have been provided above.

[0081] As an example, consider FIG. **7** which illustrates the FIG. **2** embodiment. In this example, a finger **700** has touched touch screen **202**.

[0082] Responsive to sensing the user's input, step **602** applies an electrical signal, such as a voltage or a voltage profile to conductive layers that are supported by substrates, such as those conductive layers and substrates that are described above. Any suitable type of electrical signal can be applied including those that are defined by voltage profiles